

REMARKS

Before entry of this Amendment and Response, the status of the application according to the pending Office action is as follows:

- The Abstract of the disclosure is objected to because it contains the title of the invention.
- Claims 1-3, 5, 6, 9, 11, 17, 19-21, 23-25, and 28 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,679,152 to Perdue (hereinafter “Perdue”).
- Claims 11-15, 17, and 19-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,389,329 to Colens (hereinafter “Colens”).
- Claims 26-30 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,710,506 to Broell (hereinafter “Broell”).
- Claim 16 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Colens in view of Broell.
- Claims 4, 7, 8, 10, and 18 are objected to as depending from a rejected claim, but would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

Applicants hereby amend the page of the specification containing the Abstract to delete the title of the invention. Applicants hereby amend claims 1, 5, 8, 11, 12, 17, 26, 28, and 30, cancel claims 7 and 18, and add new claims 31 and 32. Claim 1 is amended to incorporate the allowable subject matter from dependent claim 7. Claim 17 is amended to incorporate the allowable subject matter from dependent claim 18. Claims 5, 11, 26, 28, and 30 are amended to more clearly define the subject matter that Applicants regard as the invention. Claim 8 is

amended to correct its dependency. Claim 12 is amended to reflect the amendment. No new matter has been added by any amendments or the new claims. Support for the amendments and new claims can be found at least at paragraphs [0020], [0063], [0064], [0067], [0072] – [0073], [0079], and [0082]; claims 7 and 18; and FIGS. 4C, 7, and 8.

In view of the above amendments and following remarks, Applicants respectfully request reconsideration and withdrawal of all grounds of rejection and objection and passage of claims 1-6, 8-17, and 19-32 to allowance in due course.

1. The Abstract of the disclosure is objected to because it contains the title of the invention. With this Amendment and Response, Applicants hereby amend the page containing the Abstract to delete reference to the invention title. Accordingly, Applicants respectfully request withdrawal of the objection to the specification.

2. Claims 1-3, 5, 6, 9, 11, 17, 19-21, 23-25, and 28 are rejected under 35 U.S.C. § 102(b) as being anticipated by Perdue. Applicants respectfully traverse this rejection, as applied to the claims, as amended.

Applicants have amended claim 1 to include the allowable subject matter of claim 7 and contain supporting language from intervening dependent claim 5; however, not all language of intervening claim 5 has been incorporated into claim 1. Nonetheless, Applicants respectfully submit that amended claim 1 is patentable over Perdue. As noted in the Office action, none of the art of record appears to teach, either alone or in combination, a method including the combination of steps now recited in claim 1.

Applicants have amended claim 17 to include the allowable subject matter of claim 18. Accordingly, Applicants respectfully submit that amended claim 17 is patentable over Perdue. As noted in the Office action, none of the art of record appears to teach, either alone or in combination, an autonomous system including the combination of steps now recited in claim 17.

Perdue appears to disclose a navigation system for a robot 20 that allows the robot 20 to mate with a charger 50. Perdue, Abstract. When the robot's controller 206 detects a low charge state of the storage battery 207, the robot 20 initiates a sequence to locate its charger 50. *Id.*, col. 10, ll. 24-29. The charger 50 includes three infrared ("IR") light-emitting diodes ("LEDs") 56A-C that emit a single IR signal that the robot 20 utilizes to locate the charger 50. *Id.*, col. 4, l. 65 – col. 5, l. 9; col. 6, ll. 54-59. This single IR signal covers the entire room with an emitted 35 kHz signal. *Id.*, col. 4, l. 65 – col. 5, l. 9; col. 6, LL. 23-27. As the robot 20 moves toward the charger 50, if the IR signal is no longer detected by the robot's photodiode 42, the robot 20 stops and makes a small rotation to reestablish alignment with the beam, then continues toward the charger 50. *Id.*, col. 6, ll. 59-68. Ultimately, the robot 20 engages the contacts 52, 54 of the charger 50 and the battery 207 is charged. *Id.*, col. 8, ll. 35-43.

In amended claim 11, Applicants claim a method of docking a robotic device with a base station, the method comprising, *inter alia*, the step of "maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the base station." Applicants respectfully submit that Perdue does not teach or suggest at least the step of "maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the base station." As noted above, the three IR LEDs 56A-C emit a single IR signal that the robot 20 utilizes to locate and approach the charger 50.

There is no teaching that the LEDs emit more than one signal, thus, Applicants respectfully submit that amended claim 11 is not anticipated by Perdue.

In amended claim 28, Applicants claim a system for charging an autonomous mobile device, the system comprising a mobile device. This mobile device includes, *inter alia*, “circuitry for confirming a presence of the device across the charging terminals by recognizing a load formed by a circuit in the charger combined with a complimentary circuit in the device.” Applicants respectfully submit that Perdue does not teach a device including at least “circuitry for confirming a presence of the device across the charging terminals by recognizing a load formed by a circuit in the charger combined with a complimentary circuit in the device.” Indeed, Perdue appears to provide no detail regarding the charging operation of the robot 20; accordingly, Applicants respectfully submit that amended claim 28 is not anticipated by Perdue.

Applicants respectfully submit that amended independent claims 1, 11, 17, and 28 are patentable over Perdue under 35 U.S.C. § 102(b). Because claims 2, 3, 5, 6, 9, 19-21, and 23-25 depend, either directly or indirectly, from the amended independent claims, and include all the respective limitations thereof, Applicants respectfully submit that these claims are patentable as well. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-3, 5, 6, 9, 11, 17, 19-21, 23-25, and 28 based on Perdue under 35 U.S.C. § 102(b).

3. Claims 11-15, 17, and 19-22 are rejected under 35 U.S.C. § 102(b) as being anticipated by Colens. Applicants respectfully traverse this rejection, as applied to the claims, as amended.

Applicants have amended claim 17 to include the allowed subject matter of claim 18. Accordingly, Applicants respectfully submit that amended claim 17 is patentable over Colens.

As noted in the Office action, none of the art of record appears to teach, either alone or in combination, an autonomous system including the combination of steps now recited in claim 17.

Colens appears to disclose a mobile robot 7 and a station 1 therefor. Colens, Abstract. The station 1 emits, in one embodiment, an infra-red beam of strong power 3' and a narrow beam of low power 2'. Id., col. 8, ll. 23-24, 59-60; FIGS. 1, 2. During operation, sensors 10a, 10b on the robot 7 detect the IR beam of strong power 3' and the on-board microcomputer directs the robot 7 to progress toward the origin of the signal. Id., col. 8, ll. 33-44. As the robot 7 arrives "at the level of the generator 3, the signal collected by the sensors 10a, 10b decreases considerably and becomes definitely less strong than the signal coming from narrow beam 2'." Id., col. 8, ll. 60-64. At this point, the robot 7 aligns its sensors 10a, 10b with beam 2' and moves into a contacting position with the station 1 for battery recharging. Id., col. 9, 1-5. In a second embodiment, Colens discloses a different origin of beam 3', as a "virtual origin 3a obtained by the crossing at the point 3a of two beams of origin 3b and 3c." Id., col. 7, ll. 53-56, FIG. 3. Colens appears to provide no additional detail or functionality regarding this embodiment or how the robot interacts with the three beams 3b, 3c, and 3'. Assuming the robot 7 interacts in a similar manner, as the robot 7 approaches the station 1, the narrow beam of low power 2' would play its role in guiding the robot 7. Id., col. 8, ll. 60-67. During positioning, the strong beam will be "out of the detection plane" of the robot sensors, id., col. 2, ll. 47-50, at which point, the robot 7 should follow the narrow beam 2'.

In contrast, Applicants claim, in amended claim 11, a method of docking a robotic device with a base station, the method comprising the step of "maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the

base station.” Applicants respectfully submit that Colens does not teach a method of docking a robotic device with a base station including at least the step of “maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the base station.” Colens does appear to describe the use of two beams 3’, 2’ to help guide the robot 7 to the docking station 1. Unlike Applicants’ claimed invention, however, the robot 7 disclosed in Colens first tracks the strong beam 3’ until it reaches the level of the generator 3 (or, in the alternative embodiment, the virtual origin 3a of the two beams 3b, 3c). At this point, Colens indicates that the strong beam 3’ is out of the detection plane of the robot 7, thus causing the robot 7 to follow the narrow beam 2’, until it docks with the station 1. See id. Therefore, Colens does not disclose “maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the base station.” Instead, the robot 7 *sequentially* tracks the beams: *first* the strong beam 3’, *followed by* the narrow beam 2’, to arrive at the base station 1. Accordingly, Applicants respectfully submit that amended claim 11 is not anticipated by Colens.

Applicants respectfully submit that amended independent claims 11 and 17 are patentable over Colens under 35 U.S.C. § 102(b). Because claims 12-15 and 19-22 depend, either directly or indirectly, from the amended independent claims, and include all the respective limitations thereof, Applicants respectfully submit that these claims are patentable as well. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 11-15, 17, and 19-22 based on Colens under 35 U.S.C. § 102(b).

4. Claims 26-30 are rejected under 35 U.S.C. § 102(b) as being anticipated by Broell. Applicants respectfully traverse this rejection, as applied to the claims, as amended.

Broell appears to disclose a battery charger for devices such as cellular phones, laptop computers, electric motor-driven tools, and vehicles. Broell, Abstract, col. 1, ll. 7-10. The charger appears to be able to test for a presence of the battery at the charger, and charge the battery utilizing different charging modes. Id., Abstract, col. 8, ll. 29-65. Once charged, the charger may enter a maintenance state, where self-discharge from the battery is accounted for and the level of energy therein is maintained. Id., col. 23, ll. 13-23.

In contrast, Applicants claim, in amended claim 26, a method of charging a battery of a device, the method including the step of, *inter alia*, “confirming a presence of the device across the charging terminals by recognizing a load formed by a circuit in the charger combined with a complimentary circuit in the device.” Amended claim 28 recites similar language. Applicants respectfully submit that Broell does not teach a method of charging a battery including at least the step of “confirming a presence of the device across the charging terminals by recognizing a load formed by a circuit in the charger combined with a complimentary circuit in the device.” In fact, the charger of Broell appears to detect the presence of only the battery. Accordingly, Applicants respectfully submit that amended claims 26 and 28 are not anticipated by Broell.

Applicants respectfully submit that amended independent claims 26 and 28 are patentable over Broell under 35 U.S.C. § 102(b). Because claims 27 and 29-30 depend, either directly or indirectly, from the amended independent claims, and include all the respective limitations thereof, Applicants respectfully submit that these claims are patentable as well. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 26-30 under based on Broell 35 U.S.C. § 102(b).

5. Claim 16 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Colens in view of Broell. With this amendment, Applicants hereby amend claim 11, from which claim 16 ultimately depends. As described above, Colens does not disclose “maintaining an orientation of the robotic device relative to both the right signal and the left signal as the robotic device approaches the base station” as claimed in claim 11. Broell does not cure this deficiency, as it is directed specifically to charging of a battery, as described above. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 16 under 35 U.S.C. § 103(a).

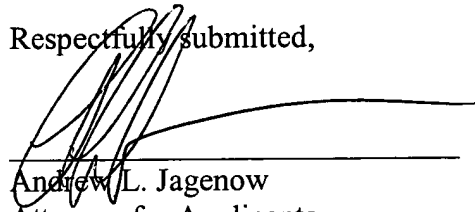
6. With this Amendment and Response, Applicants hereby add new claims 31 and 32. As these claims contain all limitations of the claims from which they respectively depend, Applicants respectfully assert that these claims are patentable for the reasons given with regard to those claims, and allowance of claims 31 and 32 is respectfully requested.



CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration, withdrawal of all grounds of rejection and objection, and allowance of claims 1-6, 8-17, and 19-32 in due course. The Examiner is invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,



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